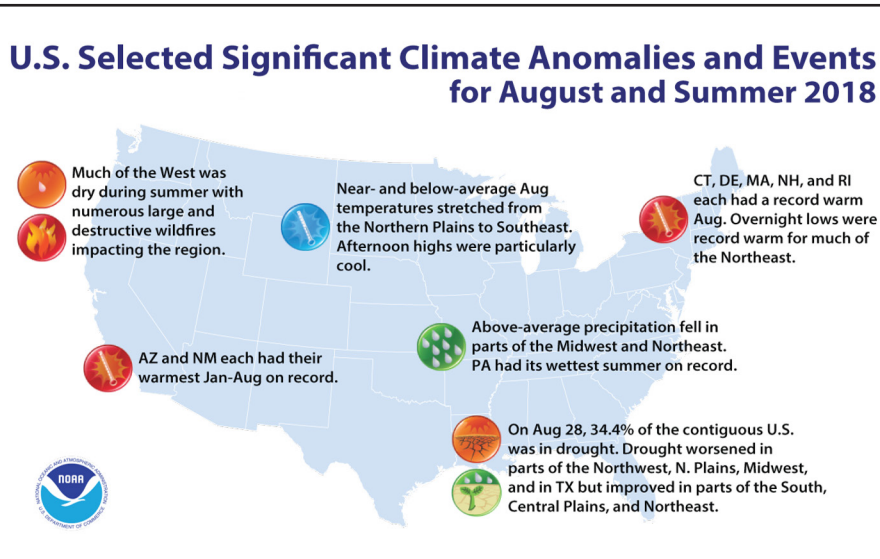




National – Significant Events for June - August 2018



Highlights for the Basin

Summer began extremely warm but ended with cooler temperatures across much of the Basin. Colorado had its 3rd warmest summer on record.

Several areas of the Basin had a wet summer. For instance, portions of southeastern South Dakota and northeastern Nebraska had one of their wettest summers on record.

However, drought was an issue for some areas, impacting crops and water supplies in Colorado, the Dakotas, Kansas, and Missouri.

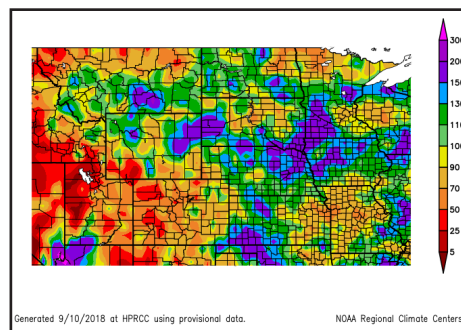
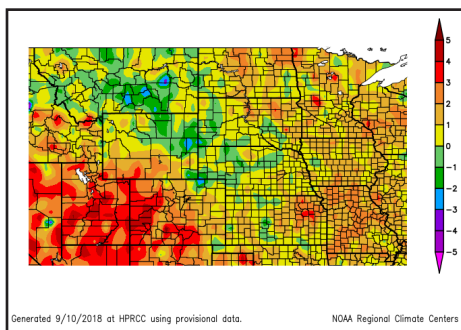
Smoke from wildfires in Canada prompted the issuance of air quality alerts for Bismarck and Fargo, ND. A wildfire burned across areas of Glacier National Park in Montana, destroying structures and forcing evacuations.

The average U.S. temperature during August was 73.6°F, 1.5°F above average. The summer average U.S. temperature was 73.5°F, 2.1°F above average, and the fourth warmest on record. The August U.S. precipitation was 2.99 inches, 0.37 inch above average. The summer average U.S. precipitation was 8.95 inches, 0.63 inch above average. For more information, please see: <https://www.ncdc.noaa.gov/sotc>.

Regional – Climate Overview for June - August 2018

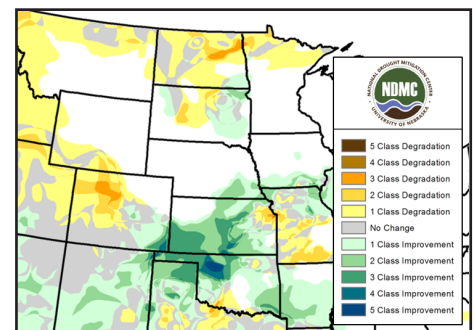
Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Summer 2018



Drought

U.S. Drought Monitor Class Change Jun. 19-Sep. 11, 2018



Summer temperatures varied across the Missouri Basin, with slightly below-normal temperatures in portions of the Upper Basin while temperatures across the rest of the region were generally above normal. However, average summer temperatures masked the extremes that occurred. For instance, June was quite warm for much of the Basin, while average temperatures in July and August were on the cool side. June ranked among the top 10 warmest for Colorado, Kansas, Missouri, and North Dakota. Precipitation varied but it was generally wet across the Basin, particularly throughout portions of South Dakota and Nebraska. However, dryness persisted in northern Colorado, eastern Kansas, and a large part of Missouri where drought intensified over the summer.

Warm temperatures and below-normal precipitation caused drought to intensify across northwestern Missouri, northern and eastern Kansas, and southeastern Nebraska throughout the summer. However, much-needed rains fell in August, which helped relieve conditions. Late-summer dryness resulted in drought spreading and intensifying rapidly across portions of the Dakotas.



Regional – Impacts for June - August 2018

Water Resources

Due to above-normal snowpack and heavy spring rains in the Upper Basin this year, the U.S. Army Corps of Engineers projected the Upper Missouri River to have its fourth highest runoff on record. High runoff on the Yellowstone River, a major tributary to the Missouri River, resulted in releases through Bismarck, ND that were double the average summer flows. Meanwhile, heavy rainfall caused flooding in several locations, including Brookings, SD and Manhattan, KS. Ongoing drought impacted water supplies this summer across portions of Iowa, Kansas, and Missouri. Several communities faced water shortages and mandatory water restrictions, such as Hamilton, MO and Gardner, KS.

Agriculture

Despite a slow start to the growing season this year, above-normal temperatures in June helped crops progress quickly, leading to early maturation. As a result, the risk of damage from an early frost is lower this year. Drought caused stress to crops and pastures, and emergency haying and grazing of Conservation Reserve Program lands was authorized in several Basin states, including CO, IA, KS, and MO. Numerous hailstorms damaged row crops, grain bins, and center pivots in the Dakotas and Nebraska during the summer, and losses were still being assessed by the USDA Risk Management Agency.



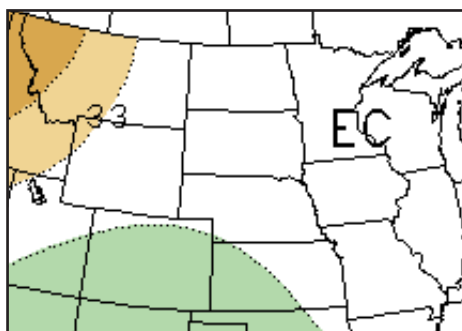
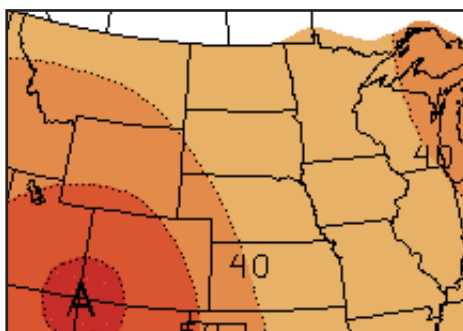
Above: Flooding along Wildcat Creek near Manhattan, KS, photo courtesy Manhattan Police Dept. (left); Dry pasture in Adams County, ND, photo courtesy NDSU (middle); Hail-damaged corn in Howard County, NE, photo courtesy Troy Ingram, UNL CropWatch (right).

Regional – Outlook for October - December 2018

Temperature

Precipitation

Outlooks for October - December 2018



EC: Equal chances of above, near, or below normal

A: Above normal, B: Below normal

ENSO-neutral conditions are present in the Pacific Ocean, but the likelihood of the onset of El Niño will increase this fall and especially during the winter. Above-normal temperatures are favored across the entire Basin through December. Below-normal precipitation is expected in the Upper Basin in the western half of Montana and northwestern Wyoming, while above-normal precipitation is favored for portions of Colorado and Kansas. Elsewhere in the Basin, there are equal chances for above-, below-, and near-normal precipitation through December. The U.S. Army Corps of Engineers plans to continue higher-than-average releases from all Missouri River Mainstem System dams through the fall to evacuate remaining stored flood waters.

MO River Basin Partners

High Plains Regional Climate Center
www.hprcc.unl.edu

National Drought Mitigation Center
<http://drought.unl.edu/>

National Integrated Drought Information System
<https://www.drought.gov/>

NOAA NCEI
www.ncdc.noaa.gov

NOAA NWS- Central Region
www.crh.noaa.gov/crh

NOAA NWS Climate Prediction Center
www.cpc.ncep.noaa.gov

NOAA NWS Missouri Basin River Forecast Center
www.crh.noaa.gov/mbrfc

American Association of State Climatologists
<https://www.stateclimate.org/>

U.S. Army Corps of Engineers
www.usace.army.mil

U.S. Bureau of Reclamation
<https://www.usbr.gov/>

USDA Natural Resources Conservation Service
www.nrcs.usda.gov

USDA Northern Plains Climate Hub
www.climatehubs.ocs.usda.gov

Western Governors' Association
<http://westgov.org>